

FINAL INTERIM HABITAT MANAGEMENT PLAN

MARICOPA SUN SOLAR COMPLEX PROJECT, KERN COUNTY, CALIFORNIA

November 2014



Quad Knopf

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Maricopa Sun Solar Complex Project, Kern County, California

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1.0 INTRODUCTION

The Maricopa Sun Solar Complex will be constructed within a 5,784.3-acre Permit Area, located in southwestern Kern County. Upon full build-out, the Maricopa Sun Solar Complex Project will result in a combination of Solar Sites (consisting of photovoltaic panels, inverters, transformers, transmission lines, and other associated infrastructure), Movement Corridors (areas managed to facilitate wildlife movement around the Solar Sites), and Conservation Sites (areas managed to provide habitat for wildlife).

This Interim Habitat Management Plan (IHMP) describes the ecological and resource management actions that will take place on the Conservation Sites, Solar Sites and Movement Corridors during the Interim Period. Conservation Sites, Solar Sites and Movement Corridors are anticipated to be added to and managed according to this IHMP as the various Solar Sites are developed. The Interim Period will last 35 years and will conclude with the expiration of the Maricopa Sun Multiple Species Habitat Conservation Plan. The IHMP includes capital expenditures (e.g. initial fence installation, signage installation, earthwork) as well as an increased level of monitoring that will be implemented during the Interim Period. The IHMP will be implemented conjunctively with the Long Term Habitat Monitoring Plan (LTHMP), until the conclusion of the Interim Period, at which point the Project will be managed solely by the LTHMP.

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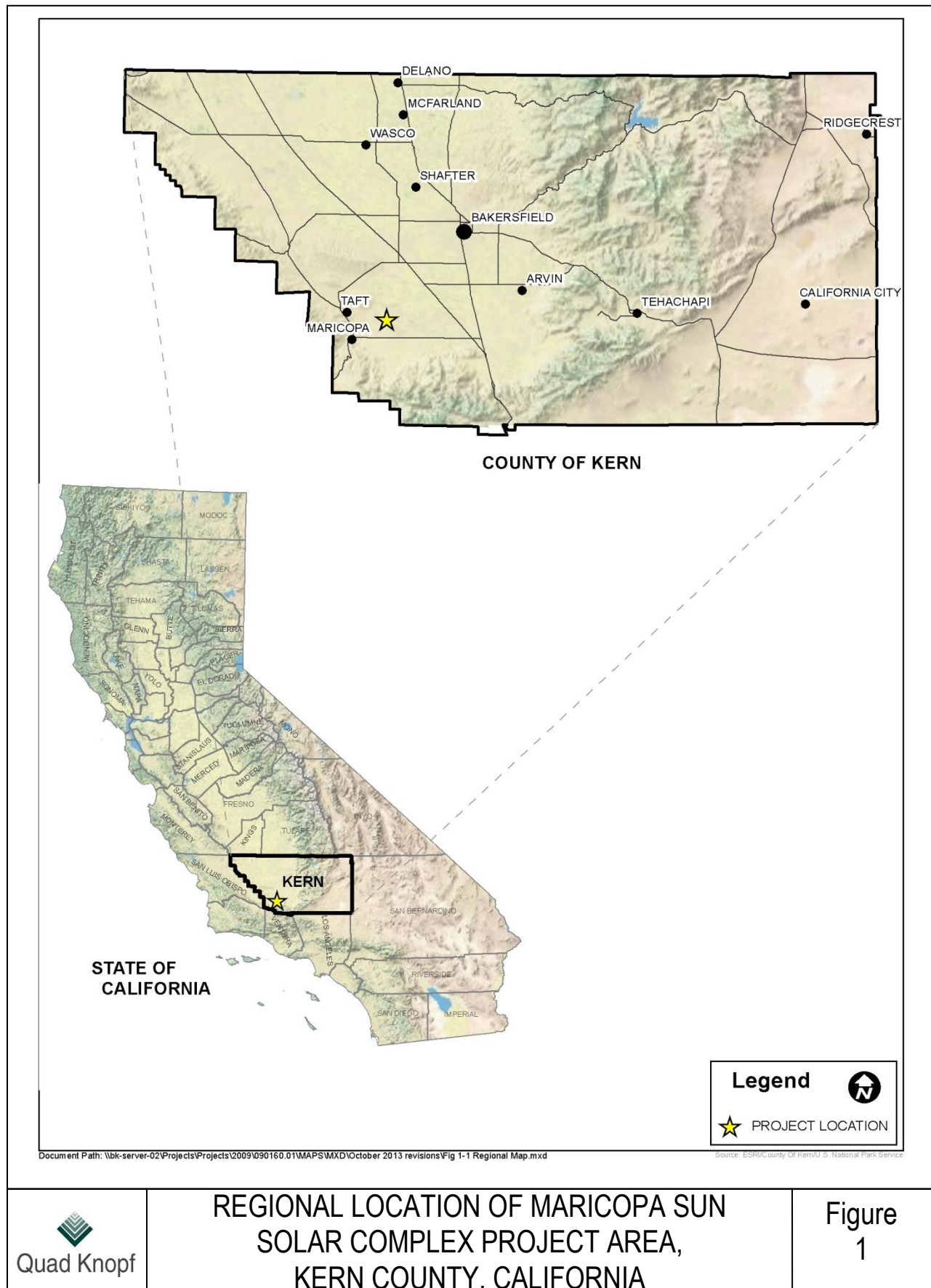
1.1 Background

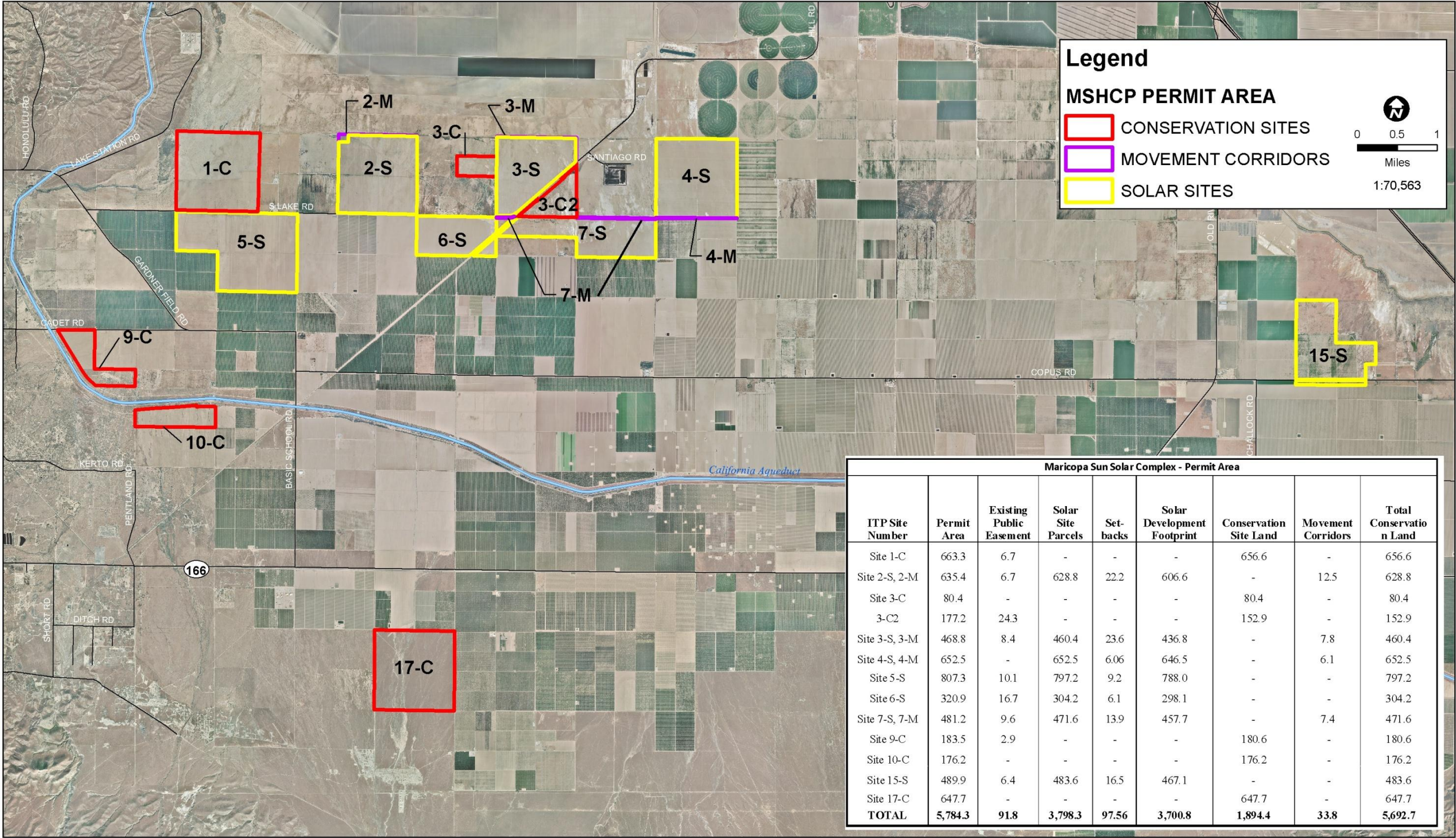
The Maricopa Sun Solar Complex will be constructed within a 5,784.3-acre Permit Area, located in southwestern Kern County (Figure 1). The Project will result in the creation of three different land types (Figure 2): Solar Sites, which will include the photovoltaic panels and associated infrastructure; Movement Corridors, which are areas designed to facilitate wildlife movement around the Solar Sites; and Conservation Sites, which will be permanently conserved and managed as wildlife habitat, concurrent with the development of the Solar Sites. The construction of the Project will be phased and is anticipated to take approximately 10-15 years to reach full build-out. The Project is anticipated to last 35 years, including decommissioning. This IHMP and the Habitat Conservation Plan (MSHCP) (Maricopa Sun, LLC Habitat Conservation Plan 2014) associated with the Project is being developed for incidental take coverage for San Joaquin kit fox (*Vulpes macrotis mutica*), Tipton kangaroo rat (*Dipodomys nitratooides*), Nelson's antelope squirrel (*Ammospermophilus nelsoni*), western burrowing owl (*Athene cunicularia*), and blunt-nosed leopard lizard (*Gambelia sila*) (collectively, Covered Species).

Maricopa Sun, LLC (Project Administrator) is the Permittee for the Project and will maintain an ongoing administrative role in all phases and aspects of the Project, including ongoing habitat management for the Conservation Sites. Any transfer of ownership or administrative obligations of the Conservation Sites will be approved in writing by the United States Fish and Wildlife Service (USFWS).

1.2 Scope and Purpose

This IHMP is intended to describe all of the ecological and resource management activities that will take place on the Conservation Sites, Solar Sites and Movement Corridors during the 35-year life of the Project, as well as all necessary capital ecological improvement actions within the Permit Area (Table 1). The Project will be phased; thus, various ecological management activities may begin and end at different times throughout the life of the Project. The IHMP differs from the Long-Term Habitat Management Plan (LTHMP), in that the LTHMP describes activities that will commence with the recordation of the Conservation Easement on a particular property, will be limited to the Conservation Sites, and will continue on in perpetuity; whereas the IHMP will commence with the development of a Solar Site, will have activities on all three land types (Solar Sites, Movement Corridors, and Conservation Sites; individual parcels within the Permit Area without respect to land types are, Sites), and will last only for the duration of the MSHCP/Project. The purpose of having two plans that are implemented conjunctively is to account for the capital improvement actions (e.g. fence installation, signage installation, earthwork) and increased study associated with the 35-year term of the MSHCP (via the IHMP) and, at the same time, describe the mitigation actions that will continue in perpetuity on the Conservation Sites (via the LTHMP). This also provides for a distinction in funding, where IHMP activities will be funded directly or indirectly by the Project Administrator and LTHMP activities will be paid for by the interest generated from the funded endowment account.





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SITE PLAN
MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure 2

Table 1
Habitat Management Plan Comparison

	Interim Habitat Management Activities	Long-term Habitat Management Activities
Starting Action	Upon development of Solar Site	Upon recordation of Conservation Easement on Conservation Sites
Duration	35 years/Permitted life of Project	Perpetuity
Land Types	Solar Sites, Movement Corridors, Conservation Sites	Conservation Sites (will cover all sites) following decommissioning of Solar Sites)

The IHMP and the LTHMP will be implemented conjunctively and thus have management activities that overlap (e.g., annual reporting, trash removal, species monitoring). For activities where the IHMP and LTHMP overlap, the activity will be paid for initially via the funding of the IHMP. Following the completion of overlapping activities, the Project Administrator may bill the endowment associated with the LTHMP (assuming that the endowment has the funds accumulated and available) to recover the cost of the overlapping activities. There will also be monitoring and clearance surveys associated with the pre-construction, construction, operations and maintenance, and decommissioning of the Solar Sites. Monitoring and clearance surveys are not covered in this IHMP or the LTHMP.

1.3 Phasing

The Project is anticipated to be constructed over the next 10-15 years as market demands and interest dictate (additional details regarding Project Phasing can be found in Chapter 8 of the MSHCP 2014). The construction of solar facilities on the Solar Sites precipitates the conservation of a proportionate amount of the Conservation Sites and the designation of Movement Corridors, where applicable. The construction of a Solar Site also triggers the applicability of this IHMP and the activities described herein. The Project has an anticipated 35-year lifespan (Interim Period), at which point the Solar Sites will be decommissioned and the solar facilities removed. During the Interim Period, the Solar Sites will be managed for solar operations and not specifically for Covered Species. The future development of the Solar Sites will be limited by a “Springing” Conservation Easement that will take effect following the conclusion of the term of the MSHCP. The idea of a “springing conservation easement” is that the lands intended for conservation will be managed for another purpose during an initial timeframe (i.e., the Interim Period) and then, once the Interim Period (following decommissioning) is complete, will “spring” into effect as conservation lands under the Conservation Easement. Following decommissioning, the Solar Sites will be protected and managed for Covered Species and become subject to the LTHMP. Any capital ecological improvements required for the Solar Sites, as the decommissioned Solar Sites are transitioned to management via the LTHMP, will be paid for via the IHMP.

1.4 IHMP Funding

Funding for the implementation of IHMP activities (both capital improvements and monitoring actions) will be provided by the Project Administrator. Prior to the development of any individual Phase of the Project, an IHMP implementation security (Security) will be provided by the Project Administrator to the Conservation Easement Holder in the form of an irrevocable

standby letter of credit (LOC). The Security will be maintained in an amount sufficient to complete the three following years of IHMP activities in each developed phase (Table 10-2). The first year of development of any individual Phase will require a greater Security amount, because of capital improvement costs in Year 1 (Year 1 LOC), but then following completion of the capital improvement activities, the Security will decrease to and be maintained for the duration of the Project. A level of funding sufficient to implement the subsequent three years of IHMP monitoring activities (Ongoing LOC; Table 2). The Project Administrator will ensure that the appropriate amount of Security will remain in effect throughout the duration of the Project. Specific details of the Security calculation can be found in Exhibit A to the IHMP.

Table 2
Interim Habitat Management Plan – Phased Security Summary

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6
Construction Cost	\$181,282	\$146,322	\$105,329	\$86,502	\$146,005	\$ -
Annual Monitoring Cost	\$27,034	\$42,390	\$58,907	\$74,457	\$91,168	\$91,168
Tier 2 Monitoring Cost	\$72,600	\$130,680	\$174,240	\$203,280	\$232,320	\$261,360
<u>Year 1 LOC*</u> (3 years of IHMP activities w/ construction)	\$480,183	\$665,531	\$804,771	\$919,712	\$1,116,469	\$1,057,584
<u>Ongoing LOC**</u> (3 years of IHMP activities, no construction)	\$298,901	\$519,209	\$699,442	\$833,210	\$970,464	\$1,057,584

*Calculated by adding “Construction Cost” to 3 years of “Annual Monitoring Cost” and 3 years of “Tier 2 Monitoring Cost”

**Calculated by adding 3 years of “Annual Monitoring Cost” and 3 years of “Tier 2 Monitoring Cost”

1.5 Project Description

1.5.1 GEOGRAPHY, TOPOGRAPHY, CLIMATE

The Project is located approximately five miles east of the City of Taft in an unincorporated portion of southwestern Kern County, generally along South Lake Road and Old River Road, east of Gardner Field Road. The Project is made up of multiple, non-contiguous parcels totaling 5,784.3 acres. Three of the Conservation Sites are located approximately 2-5 miles south of South Lake Road, where the majority of the Solar Sites are located.

The Permit Area lies just north of the Transverse Ranges, near the base of the San Emigdio Mountains, east of the Temblor Range and south of the historic southern shore of Buena Vista Lake. The Permit Area lands are level, consisting predominantly of disked, fallowed agricultural fields, levees, berms, and roadways; with some Conservation Sites being ruderal land or naturalized/native habitat. Elevations within the Permit Area range from approximately 320 feet above mean sea level (AMSL) to the east to 900 feet AMSL to the south. Low undulating relief remains on parcels within the Permit Area that are disked, but they have not been laser leveled nor do they retain their natural topography.

The Permit Area has a Mediterranean climate, with cool wet winters and hot dry summers. The average high temperatures are 48.5 degrees Fahrenheit in the winter and 94.8 degrees Fahrenheit in the summer. The average annual precipitation is 6.32 inches, falling predominantly as rain. The prevailing wind is from the west-northwest, with highest wind speeds in April and May, averaging 7.7 miles per hour (USDA 2009).

1.5.2 SURROUNDING LAND USE

Lands adjacent to the Permit Area consist predominantly of active agricultural cultivation including permanent tree crops (e.g., almonds, cherries), row and field crops (e.g., carrots, alfalfa), actively disked fallowed ground, and uncultivated grasslands used for grazing. The uncultivated grazing ground consists of natural or naturalized grasslands habitats, and in some areas provides connectivity to the Buena Vista Hills to the west and San Emigdio Mountains to the south. The grasslands to the west and south also are used for oil production and are associated with the Midway Sunset Oil Field and the Naval Petroleum Reserve.

1.5.3 SOILS

The soils within the Permit Area are highly variable, consisting of nine different soil types (Table 2).

1.5.4 HYDROLOGY

The only significant active hydrologic feature near the Permit Area is the Kern River, about 11 miles to the north. Several smaller blue-line streams flow out of the San Emigdio Mountains to the south and the Transverse Range to the west, all terminating at Buena Vista Lake. Portions of the Permit Area are also mapped by the Federal Emergency Management Area as being within the 100-year floodplain. Santiago Creek, a named blue-line feature, flows through Conservation Site 17-C, and several other unnamed blue-line features are mapped throughout the Permit Area. Santiago Creek is a likely, though unconfirmed, “Water of the U.S.” as defined by the Clean Water Act. The only verified wetlands or waters that occur within the Permit Area that are under federal authority are a 2.55-acre wetland area located in the extreme northwest corner of Solar Site 2-S, and a Water of the U.S. occurring on Conservation Site 1-C. The remaining hydrologic features in the vicinity of the Permit Area consist of man-made water conveyance facilities, such as irrigation ditches, canals and the California Aqueduct.

Table 3
Soil Types Occurring Throughout the Maricopa Sun Solar Complex

Location	Soil Type Present
Site 1-C	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes), 153-Tupman gravelly sandy loam (0-2 percent slopes), 160-Fages clay (0-1 percent slopes), and 352-Posochanet-Posochanet (partially reclaimed association, 0-1 percent slopes)
Site 2-S, 2-M	133-Calflax loam (0-1 percent slopes) and 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
Site 3-S, 3-M	133-Calflax loam (0-1 percent slopes), 160-Fages clay (0-1 percent slopes)
Site 3-C	133-Calflax loam (0-1 percent slopes), 160-Fages clay (0-1 percent slopes)
Site 3-C2	133-Calflax loam (0-1 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
Site 4-S, 4-M	133-Calflax loam (0-1 percent slopes) and 350-Posochanet silt loam (saline-sodic, 0-1 percent slopes)
Site 5-S	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), 150-Excelsior sandy loam (0-2 percent slopes), 151- Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes), 152-Excelsior loam (0-2 percent slopes)
Site 6-S	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), and 152-Excelsior loam (0-2 percent slopes)
Site 7-S, 7-M	133-Calflax loam (0-1 percent slopes), 151-Excelsior fine sandy loam (saline-sodic, 0-1 percent slopes)
Site 9-C	132-Cerini loam (0-2 percent slopes), 133-Calflax loam (0-1 percent slopes), and 150-Excelsior sandy loam (0-2 percent slopes)
Site 10-C	132/134-Cerini loam (0-2 percent slopes/2-5 percent slopes), and 152-Excelsior loam (0-2 percent slopes)
Site 15-S	133-Calflax loam (0-1 percent slopes), 151-Excelsior fine sandy loam (saline-sodic; 0-2 percent slopes), and 160-Fages clay (0-1 percent slopes)
Site 17-C	134-Cerini loam (0-2 percent slopes) and 192-Guijarral-Klipstein complex (2 -5 percent slopes)

1.5.5 HABITAT TYPES

The habitat type within the Permit Area consists predominantly of disked, fallowed farmland. All of the Solar Sites and Movement Corridors, and some of the Conservation Sites (1-C, 3-C and a portion of 9-C) are disked regularly to maintain the Sites free of vegetation. Conservation Site 17-C and an approximately 80-acre portion of Conservation Site 9-C appear to be un-disked, retain their natural topography, and have vegetation consisting of a mixed non-native annual grassland and saltbush scrub mosaic consistent with other surrounding natural areas. Conservation Site 3-C2 was disked approximately 6 years ago and appears to be in the process of returning to an annual grassland.

The disked portions of the Permit Area provide very little habitat value for plants and wildlife. Regular disking prevents the colonization of plants and animals, and because the sites remain fallow, there is no wildlife benefit from the production of agricultural crops. These disked fields

only provide open space that allows for movement of wildlife across the fields, and marginal foraging opportunities when adjacent to parcels that contain natural communities.

The un-disked Conservation Sites (both intact and recovering) provide significant habitat value and connectivity to local plant and wildlife communities. Much of the surrounding area, as well as the broader of the San Joaquin Valley, have been converted to agricultural production or urban development. This development has reduced the acreage of native habitat and reduced the populations of native plants and wildlife. These un-disked Conservation Sites, as well as the other Conservation Sites following the cessation of disking, provide critical refugia for native plants and wildlife and contribute to the persistence of these species.

1.5.6 CONSERVATION AND ENDANGERED SPECIES RECOVERY VALUE

The Permit Area, upon construction, will immediately begin to contribute to the recovery of species. Concurrent with the start of development, the Conservation Sites will begin to be permanently protected with Conservation Easements, have endowments to ensure long-term management, and will be monitored and managed for their habitat values. Further, the Solar Sites will be managed in a way that does not preclude wildlife and endangered species colonization. The Solar Sites, while in energy production, will only provide marginal habitat value, but they are anticipated to be colonized by plant and wildlife species, which will result in an increase in locally available habitat over the previously disked condition. Upon decommissioning, the Solar Sites will have the energy production facilities and infrastructure removed, and the Solar Sites will be protected by the Springing Conservation Easement and managed for their habitat values for Covered Species.

The various land types within the Permit Area will contribute to the recovery of species to varying degrees during the energy production life of the Project. The Conservation Sites (and the remainder of the Project following decommissioning) contribute to the following recovery priorities and tasks as outlined in the Recovery Plan for Upland Species of the San Joaquin Valley, California (USFWS 1998):

1. Recovery Task 2.1.4 (Priority 1) – Protection of large blocks of land in Western Kern County;
2. Recovery Task 3.2.22 (Priority 3) – Multispecies animal surveys for upland vertebrates, southwestern Valley edge;
3. Recovery Task 4.26 (Priority 1) – Monitoring/Studies on dispersal, movement, diet, reproduction, use of agricultural fields, use of artificial dens for San Joaquin kit fox;
4. Recovery Task 5.3.8 (Priority 2) – Protection of linkage areas around the San Joaquin Valley Edge; and
5. Recovery Task 6 (Priority 3) – Apply adaptive management to protected areas.

The Project will contribute to the large matrix of protected land that already exists in western Kern County, and will add to the growing corridor of habitat that connects the Wind Wolves Preserve with the Naval Petroleum Reserve. The Project will also contribute to the creation of an east-west corridor of protected land that will connect the historic southern shores of Buena Vista and Kern Lakes.

1.5.7 SENSITIVE SPECIES AND VEGETATION COMMUNITIES

Western Kern County is a well-known and important area for sensitive San Joaquin Valley endemic species. While the majority of the Permit Area is disked and does not support any species, many sensitive species and sensitive vegetation communities are known from the area (Table 3).

Table 4
Sensitive Species and Vegetation Communities

Scientific Name	Common Name	Status
Sensitive vegetative communities		
Great Valley Cottonwood Riparian Forest	Great Valley Cottonwood Riparian Forest	Protected under CEQA
Great Valley Mesquite Scrub	Great Valley Mesquite Scrub	Protected under CEQA
Valley Sacaton Grassland	Valley Sacaton Grassland	Protected under CEQA
Valley Saltbush Scrub	Valley Saltbush Scrub	Protected under CEQA
Valley Sink Scrub	Valley Sink Scrub	Protected under CEQA
Plants		
<i>Allium howellii</i> var. <i>clokeyi</i>	Mt. Pinos onion	1B.3
<i>Astragalus hornii</i> var. <i>hornii</i>	Horn's milk-vetch	1B.1
<i>Atriplex cordulata</i>	Heartscale	1B.2
<i>Atriplex tularensis</i>	Bakersfield smallscale	CE, 1B.1
<i>Atriplex coronata</i> var. <i>vallicola</i>	Lost Hills crownscale	1B.2
California (<i>Erodium</i>) <i>macrophyllum</i>	round-leaved filaree	1B.1
<i>Caulanthus californicus</i> (<i>Stanfordia californica</i>)	California jewel-flower	FE, CE, 1B.1
<i>Caulanthus coulteri</i> var. <i>lemmonii</i>	Lemmon's jewelflower	1B.2
<i>Cirsium crassicaule</i>	slough thistle	1B.1
<i>Cordylanthus mollis</i> ssp. <i>hispidus</i>	Hispid bird's beak	1B.1
<i>Delphinium recurvatum</i>	recurved larkspur	1B.2
<i>Eremalche kernensis</i>	Kern mallow	FE, 1B.1
<i>Eriastrum hooveri</i>	Hoover's eriastrum	4.2
<i>Eschscholzia lemmonii</i> ssp. <i>kernensis</i>	Tejon poppy	1B.1
<i>Lasthenia glabrata</i> ssp. <i>coulteri</i>	Coulter's goldfields	1B.1
<i>Layia heterotricha</i>	Pale-yellow layia	1B.1
<i>Layia leucopappa</i>	Comanche Point layia	1B.1
<i>Monardella linoides</i> ssp. <i>oblonga</i>	Tehachapi monardella	1B.3
<i>Monolopia congdonii</i>	San Joaquin woollythreads	FE, 1B.2
<i>Stylocline citroleum</i>	oil neststraw	1B.1
Invertebrates		
<i>Branchinecta lynchi</i>	vernal pool fairy shrimp	FT
<i>Desmocerus californicus dimorphus</i>	Valley elderberry longhorn beetle	FT
<i>Euproserpinus euterpe</i>	Kern primrose sphinx moth	FT
Fishes		
<i>Hypomesus transpacificus</i>	Delta smelt	FT, CT

Table 4
Sensitive Species and Vegetation Communities (Continued)

Scientific Name	Common Name	Status
Amphibians		
<i>Rana aurora draytonii</i>	California red-legged frog	FT
<i>Spea hammondi</i>	western spadefoot	CSC
Reptiles		
<i>Actinemys marmorata pallida</i>	western pond turtle	CSC
<i>Anniella pulchra pulchra</i>	silvery legless lizard	CSC
<i>Gambelia sila</i>	blunt-nosed leopard lizard	CE, FE, CDFW fully protected
<i>Masticophis flagellum ruddocki</i>	San Joaquin whipsnake	CSC
<i>Phrynosoma blainvillii</i>	California horned lizard	CSC
<i>Thamnophis gigas</i>	giant garter snake	FT, CT
Birds		
<i>Agelaius tricolor</i>	tricolored blackbird	CSC
<i>Athene cunicularia</i>	western burrowing owl	CSC
<i>Buteo swainsoni</i>	Swainson's hawk	CSC
<i>Charadrius alexandrinus nivosus</i>	western snowy plover	FT
<i>Charadrius montanus</i>	mountain plover	CSC
<i>Circus cayaneus</i>	Northern harrier	CSC
<i>Coccyzus americanus occidentalis</i>	western yellow-billed cuckoo	CE
<i>Dendrocygna bicolor</i>	fulvous whistling-duck	CSC
<i>Elanus leucurus</i>	white-tailed kite	CDFW fully protected
<i>Eremophila alpestris actia</i>	California horned lark	CDFW watch list
<i>Falco mexicanus</i>	prairie falcon	CDFW watch list
<i>Gymnogyps californianus</i>	California condor	FE, CE
<i>Lanius ludovicianus</i>	Loggerhead shrike	CDFW watch list
<i>Plegadis chihi</i>	white-faced ibis	CDFW watch list
<i>Toxostoma lecontei</i>	Le Conte's thrasher	CSC
<i>Xanthocephalus xanthocephalus</i>	yellow-headed blackbird	CSC
Mammals		
<i>Ammospermophilus nelsoni</i>	Nelson's antelope squirrel	CT
<i>Dipodomys ingens</i>	giant kangaroo rat	FE, CE
<i>Dipodomys nitratoides brevinasus</i>	short-nosed kangaroo rat	CSC
<i>Dipodomys nitratoides nitratoides</i>	Tipton kangaroo rat	FE, CE
<i>Eumops perotis californicus</i>	western mastiff bat	CSC
<i>Onychomys torridus tularensis</i>	Tulare grasshopper mouse	CSC
<i>Perognathus inornatus inornatus</i>	San Joaquin pocket mouse	CSC, BLMS
<i>Sorex ornatus relictus</i>	Buena Vista Lake shrew	FE
<i>Taxidea taxus</i>	American badger	CSC
<i>Vulpes macrotis mutica</i>	San Joaquin kit fox	FE, CT

Status Definitions

- FE Federally Endangered
- CE California Endangered
- 1B.1 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Seriously Endangered in California
- 1B.2 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Fairly Endangered in California.
- 1B.3 California Native Plant Society List 1B Species-Plants Categorized as Rare, Threatened, or Endangered in California and Elsewhere; Not Very Endangered in California
- 4.2. Plants of limited distribution - Watch list, fairly endangered in California (20-80% occurrences threatened)

2.0 GOALS, OBJECTIVES AND MANAGEMENT

This section of the IHMP describes the ecological management, monitoring and adaptive management activities that are anticipated to be conducted on the Project. The IHMP will be administered by the Project Administrator as outlined in this IHMP, but actual management activities may be performed by a separate management entity as authorized by the USFWS. Funding for the implementation of this IHMP will be provided the Project Administrator.

2.1 Goals and Objectives

The primary biological goal of this IHMP and of the broader MSHCP (Maricopa Sun, LLC MSHCP 2014, Chapter 5) is to preserve the species and habitats for which the MSHCP has been prepared.

This goal is realized by accomplishment of the following objectives:

- Maintain, to the maximum extent possible and consistent with solar development, the ability of San Joaquin kit fox (SJKF) to disperse through the Permit Area and within the region;
- Preserve existing populations of the Tipton kangaroo rat (TKR) within the Permit Area, provide habitat for the TKR within the Permit Area;
- Preserve existing populations of the Nelson's antelope squirrel (NAS) within the Permit Area, provide habitat for the NAS within the Permit Area;
- Preserve existing populations of the western burrowing owl (WEBO) within the Permit Area, provide habitat for the WEBO within the Permit Area;
- Provide habitat for the blunt-nosed leopard lizard ("BNLL") within the Permit Area.

Species-specific objectives and tasks are described in Section 3.2 of this IHMP. Tasks in this IHMP are anticipated to commence concurrently with the construction of facilities on the first Solar Site, and will be conducted on Solar Sites, Movement Corridors and Conservation Sites as appropriate. Lands will be added to this plan iteratively until full build-out is completed, and will last for the duration of the permit (35 years). Long-term management goals and objectives are described in the associated Maricopa Sun Solar Complex Long-Term Habitat Management Plan.

2.2 Management and Personnel

The Project Administrator shall retain professional biologists, botanists, grazing managers, machinery operators, and other specialists to conduct specialized tasks (Qualified Personnel). The Monitoring Biologist is one of the Qualified Personnel. This person will be familiar with California flora and fauna and shall have knowledge regarding the ecology of the San Joaquin Valley and the habitats of the Project and the region. Qualified Personnel shall have a valid Section 10(a)(1)(a) permit for the appropriate species, when tasks require activities that would

normally require such a permit (e.g., trapping for the Tipton kangaroo rat). The Monitoring Biologist will be approved by the USFWS to conduct biological monitoring under the terms and conditions of the MSHCP.

General administration and implementation of this IHMP is the responsibility of the Project Administrator. The Project Administrator will work with the Monitoring Biologist and other Qualified Personnel to ensure that all tasks outlined in this IHMP are completed. The Project Administrator, Monitoring Biologist, and Qualified Personnel will work together as a team to implement this IHMP by exchanging information, problem solving and generally having a proactive relationship. If the Project Administrator or entity implementing Project Administrator responsibilities changes, the incoming and outgoing personnel will tour the Project together and the latter will inform the former of trends and problem areas, and will review past annual reports and identify any administrative issues.

Duties of the Monitoring Biologist may include, but are not limited to:

- Conducting biological surveys, collecting data, and preparing reports required by this IHMP;
- Evaluating conditions on the Project and recommending actions to the Project Administrator;
- Identifying and reporting opportunities and needs for adaptive management actions to the Project Administrator;
- Conducting thatch/exotic plant management activities, when necessary, with the Project Administrator; or
- Installing artificial dens and other habitat enhancements.

Other Qualified Personnel may be responsible for tasks such as:

- Implementing vegetation management activities like grazing, chemical control application, or mechanical removal; and
- Installing topographic relief features and other capital improvement activities.

3.0 ECOLOGICAL MANAGEMENT ACTIVITIES

The following specific objectives and tasks are designed to act as enhancements that further the above listed goals and objectives. These objectives and tasks provide habitat value beyond just the protection of the land, by creating supplemental habitat values that enhance the habitat value of the Project during the life of the permit. The following objectives and tasks are divided into species-specific objectives and tasks and Project-wide objectives and tasks. Tasks will be proportional to the amount of the Project that has been constructed (e.g., 50 percent of the Project has been constructed, therefore 50 percent of the total fencing will have been installed), such that upon full build-out, all of the tasks will have been implemented.

3.1 Project-wide Objectives and Tasks

“Project Wide Objectives and Tasks” include management activities that, unless otherwise specified, are applicable to the broader habitat values of the Project and are not necessarily specific to the Covered Species.

3.1.1 FENCING

Objective:

1. Install fencing to discourage unauthorized access.

Task:

1. The Project is being designed to allow and facilitate the movement of wildlife through the Conservation Sites, Movement Corridors and Solar Sites, but perimeter fencing is necessary to provide security, prevent trespass, etc., across the Project. To that end, wildlife permeable fencing will be installed around each of the Project’s land types. The Solar Site will have wildlife permeable security fencing, specifications of which can be found in Chapter 2 of the MSHCP (approximately 165,000 linear feet), which will be installed and maintained separately from this IHMP. The perimeter of the Conservation Sites and the exterior perimeter of the Movement Corridors will have a minimum of three-strand barbed wire fencing installed, with the bottom wire being barbless to contribute to the permeability of the fence for larger animals like the San Joaquin kit fox (approximately 114,750 linear feet). Development of the Project is anticipated to be phased and as such, fencing will be installed on the Conservation Sites and Movement Corridors as the Solar Sites are developed. Conservation Site 17-C is currently the only property on the Project that has existing fencing. When Conservation Site 17-C is protected, the existing fence will be inspected for its adequacy and any repairs or upgrades will be made. At least one gate will be installed on each Conservation Site and Movement Corridor to provide access for monitoring, maintenance and emergency access. Upon decommissioning of the Solar Sites, the security fence will be removed, and it will be replaced with fencing as described above for Conservation Sites.
2. Perimeter fencing and gates around Conservation Sites and Movement Corridors will be examined at least twice annually during the General Examinations (see 3.1.4 below), but fencing is anticipated to be casually observed during many of the Project’s associated activities. All issues related to the integrity of the fencing shall be immediately reported to the Project Administrator, and the Project Administrator shall make repairs as soon as practicable. The Project Administrator is responsible for implementing the repair, maintenance and replacement of all fencing, as well as ensuring that all gates remain locked to prevent unauthorized access. Additional temporary or permanent fencing may be added for maintenance purposes, grazing control, adaptive management activities, etc. Plans for changes in fencing alignment or additional fencing in the coming year will be noted in the prior year’s annual report or following discussion with the USFWS.

Access to the Conservation Sites and Movement Corridors will be prohibited, except for activities described in this IHMP, the LTHMP, and the MSHCP. Access to the Project in emergency or law-enforcement situations by medical, fire or law enforcement personnel and vehicles is allowed. Except in cases where the USFWS determines that immediate entry is required to prevent, terminate or mitigate a violation of this IHMP, access to the Conservation Sites will be provided to the USFWS with 48 hours of notice.

3.1.2 SIGNAGE

Objective:

1. Install and maintain signage to discourage unauthorized access.

Task:

1. A variety of signage will be placed around the Project. Signage that discourages public access on the Conservation Sites and Movement Corridors, and informs the public of the protection of the habitat values of the Conservation Sites and Movement Corridors will be installed around the perimeter of the Project at a rate of no less than 3 signs per mile (approximately 150 signs). Signs will be installed on the perimeter fencing to the maximum degree practicable, but may be installed on free-standing posts where appropriate.
2. Perimeter signage will be inspected at least twice annually during the General Examinations (see 3.1.4 below), but sign condition is anticipated to be casually observed during many of the Project's associated activities. All issues related to the integrity of the signage shall be immediately reported to the Project Administrator, and the Project Administrator shall make repairs as soon as practicable. The Project Administrator is responsible for implementing the repair, maintenance and replacement of all signage.

3.1.3 EARTHWORK

3.1.3.1 Movement Corridors

Objective:

1. Install topographic features in the disked Movement Corridors and Conservation Areas to provide refugia in the event of flooding.

Task:

1. Raised earthen berms will be created along the Movement Corridors to provide refugia in the event of flooding. These berms will also be the location for the installation of artificial San Joaquin kit fox dens (see Section 3.2.1, below) and burrowing owl perching posts (see Section 3.2.4, below). The berms will be constructed concurrent with the development of the associated Solar Site, using tractors or other heavy machinery. The berms will be oriented linearly in the direction of the Movement Corridor, and will be generally contiguous with

gaps installed to facilitate the movement of flood water across the berms. The berms will be constructed of compacted earth collected from the Movement Corridor or from within the Solar Sites during the construction phase. The berms will be a minimum of 15 feet wide, with a maximum height of 6 feet above grade, which will allow for settling and erosion. A ditch of no more than 10 feet wide by 3 feet deep will be constructed along the upslope side of each berm. The ditch will aid in collecting flood water and directing it off of the Project, as well as providing additional topographic complexity to the Movement Corridors.

3.1.3.2 Conservation Sites

Topographic relief will be installed in flood prone areas of the Conservation Sites. The construction of the topographic relief is described in detail in Chapter 5 of the MSHCP (Maricopa Sun, LLC MSHCP 2014).

3.1.4 GENERAL EXAMINATIONS

Objective:

1. Perform General Examinations of the Conservation Sites to evaluate habitats and infrastructure.

Task:

1. General Examinations shall occur twice annually (once in the spring and once in the fall) by Qualified Personnel, and will focus on an evaluation of: erosion, fire hazard reduction, fencing integrity, condition of signage, trash accumulation, and evidence of unauthorized vehicle use. The entire perimeter of the Project (that has been constructed) will be observed, and meandering transects will be conducted through the entirety of the Project. All observations will be recorded and included in the annual report. Previous reports should be reviewed prior to General Examinations, to help identify potential trouble spots or recurring problem areas. If any maintenance issues are identified, more frequent examinations may be performed to identify if a problem is a recurring issue and whether remedial actions are effective.

3.1.4.1 Erosion

Objective:

1. Reduce erosion that negatively affects habitat values.

Task:

1. If it is determined during the General Examinations that drainage is causing any erosion or other adverse effects that threaten the habitat values of the Conservation Sites and Movement Corridors, the Project Administrator will be notified, and erosion control measures will be implemented.

3.1.4.2 Fire Hazard

Objective:

1. Reduce the potential for fire hazard.

Task:

1. If at any time conditions on the Conservation Sites become a fire hazard (as determined or requested by the Kern County Fire Department), the Project Administrator will work with the USFWS and the local fire authorities to determine the best method to reduce the fire risk.

3.1.4.3 Trash

Objective:

1. Remove trash from the Conservation Sites.

Task:

1. Any trash found on the Conservation Sites during the General Examinations will be removed during the General Examination. Trash on the Solar Sites or generated by the Solar Sites will be managed according to the MSHCP. If trash is regularly accumulating on the Conservation Sites or Movement Corridors, the Project Administrator will implement actions to further prevent dumping. In the event that trash has accumulated or a dumping event has occurred that cannot be removed during the General Examinations, the Project Administrator will be notified and will be responsible for the removal of the trash from the Conservation Sites and Movement Corridors. In no event shall personnel performing General Examinations be responsible for removing trash associated with construction, operations and maintenance, or decommissioning of the Solar Sites, as that will be the responsibility of the Project Administrator.

3.1.4.4 Trespass

Objective:

1. Discourage unauthorized access to the Conservation Sites.

Task:

1. The perimeter of the Conservation Sites will be examined for evidence of unauthorized access. If evidence of unauthorized access is found, the Project Administrator will be notified and actions will be taken to repair any damage and develop additional measures to prevent future unauthorized access to the maximum extent practicable.

3.1.5 VEGETATION MANAGEMENT

Most of the Permit Area is disked biannually, but upon development of the Solar Sites and resultant protection of the associated Conservation Sites, disking will be discontinued. It is anticipated that vegetation will quickly begin to recolonize these sites once disking ceases. The Covered Species are most often associated with desert grassland/shrubland habitats that have low topographic relief and sparse shrub cover. Dense or tall vegetation can inhibit movements of the Covered Species and can make predator detection and avoidance more difficult (USFWS 1998). The vegetation on the Solar Sites will be managed separately from this IHMP, in a manner that facilitates operations and maintenance of the solar facilities as described in the MSHCP. The vegetation on the Movement Corridors and Conservation Sites will be managed for the benefit of the Covered Species. Vegetation on the Movement Corridors and the Conservation Sites will be managed predominantly by grazing of livestock (likely sheep), but other vegetation management techniques and tools (e.g., controlled burns, mowing, hand removal) may be used at the recommendation of the Qualified Personnel and Project Administrator, upon coordination with and authorization by the USFWS.

Objective:

1. Manage vegetation on the Movement Corridors to be 500 to 1,500lbs./acre of Residual Dry Matter (RDM).

Task:

1. Vegetation management on the Movement Corridors will be maintained at 500 to 1,500lbs./acre of RDM (vegetation management on the Conservation Sites is addressed in the LTHMP). Vegetation may occasionally exceed 1,500lbs./acre following the bolt of vegetative growth that grasslands typically experience in the spring, but grazing and/or other management techniques are anticipated to quickly reduce that vegetation back to below 1,500lbs./acre. RDM will be measured and recorded during the spring General Examination. Moderate to heavy livestock grazing in the winter and spring should result in range conditions that are within target RDM levels (Barry et al. 2006). Livestock are generally anticipated to be applied in the fall and will begin removing accumulated thatch that may have been left from the previous year. Livestock will remain present throughout the spring growth period to control grasses and forbs. Generally, livestock will be removed when target RDM levels are achieved in the spring, but livestock may be left on site later in the year to control exotic invasive weeds or problematic late season summer annuals.

Stocking rates will be determined annually in coordination with the Project Administrator and the grazing tenant. The Movement Corridors may be subdivided into smaller blocks using temporary fencing to facilitate the distribution of animals to provide focused, uniform vegetation management. Supplemental water may also be provided to facilitate uniform vegetation management. All of the numbers and dates in this plan are estimates and intended to be used as guidelines to achieve the goals and objectives. The management of this vegetation is weather dependent and methods to achieve the targets will be established by the Project Administrator in consultation with the Qualified Personnel and the grazing tenant. In

the event that RDM levels are not anticipated to exceed the prescribed thresholds and/or weed management by livestock grazing is determined by the Qualified Personnel to not be required, livestock may not be used. Grazing strategies may evolve with time, and be implemented via adaptive management as range science and recommendations from Qualified Personnel may dictate. Other vegetation management techniques and tools (e.g., controlled burns, mowing, hand removal) may be used at the recommendation of the Qualified Personnel, upon coordination with and authorization by the USFWS.

3.1.6 INVASIVE EXOTIC PEST SPECIES MANAGEMENT

Plants native to the Project are defined as those plants believed by the scientific community to have been present in Kern County and/or the San Joaquin Valley prior to European settlement. The Jepson Manual (Hickman 1993 and following revisions) can generally be used as a reference in determining if a plant is native or non-native to the San Joaquin Valley sub-region of the Great Valley. Many plant species that are common in California annual grasslands are non-native, but are considered “naturalized,” or do not threaten the habitat values of the Movement Corridors or Conservation Sites. Invasive exotic pest species are defined as plants that are not native, have a tendency to out-compete native vegetation, and negatively affect the habitat values of the Project. The California Invasive Plant Council (www.CAL-IPC.org) maintains a list of invasive exotic plant species that should be consulted in determining if a plant is a potential management concern. Plants that have a “Red-Alert” or “High” designation shall be treated as invasive exotic pest species.

Objective:

1. Monitor and maintain control over invasive exotic pest species that diminish habitat quality for the Covered Species.

Task:

1. The General Examination will include a visual estimate of cover of invasive exotic pest plant species or other non-native species invasions. Large patches (approximately 1,000 sq. ft. or greater) of invasive exotic pest plants will be mapped using a GPS and reported to the Project Administrator. Qualified Personnel will evaluate the identified patch, its likelihood of negatively affecting the habitat values of the project, and its ability to be controlled (e.g., is in the appropriate season and life stage).
2. If it is determined that the invasive exotic pest plant can be controlled, the Project Administrator will coordinate and implement the most effective control measures under the supervision of the Monitoring Biologist, which may include mechanical removal, hand removal, chemical removal, prescribed burns, or targeted grazing in a manner that will avoid disturbance to Covered Species. It may be determined that an invasive, exotic pest plant cannot be controlled that season or year. For instance, when an invasive, exotic pest plant is first identified, it may be determined that it is too late in the season to implement appropriate controls for that species; in which case control measures would need to be postponed to the following season or year. If an invasive is not controlled in a given season or year, a note will

be made in the annual report regarding the size of the patch, the species of interest, the location of the patch, and recommendations for future control. This area will be revisited by Qualified Personnel the following year, evaluated based on the recommendations for future control, and then controlled as appropriate. It is anticipated that during the early years of natural revegetation, invasive species will be common and will not be controlled. Invasive species are a typical component of natural restoration and must be allowed to continue for later seral stages to develop without extensive seeding and restoration of native species (DOI 2005).

3. Scattered tamarisk trees are present on portions of the Project. Individual trees will be removed at the recommendation and supervision of the Monitoring Biologist or other Qualified Personnel. Removal may require the use of chainsaws and/or other heavy machinery (such as a Bobcat compact track loader).

3.1.7 HABITAT MONITORING

Most of the Project consists of repeatedly disked lands that do not provide habitat that supports Covered Species. Following the cessation of disking, these lands are anticipated to begin to recover and once again become suitable to support the Covered Species. To track the progression of use by the Covered Species, a two-tiered study approach will be implemented. Tier 1 Studies will consist of broad-based, wide-ranging, cursory surveys to detect the presence of Covered Species on the Project, and are focused solely on determining if the Project is being used by Covered Species. Tier 1 Studies will include pedestrian transect surveys, night spotlighting surveys, evaluations of the use of installed dens, evaluation of the use of installed perches, and verification trapping for small mammals if burrows are encountered. Tier 2 Studies will be used to collect rigorous data on the use of the sites by Covered Species and will provide data that can be used to inform management actions. Tier 2 studies will provide information on the abundance of Covered Species, will quantitatively track changes in habitat conditions, and will provide comparative and replicated data for a statistical analysis.

3.1.7.1 Tier 1 Studies

Tier 1 Studies will be conducted each year on the Solar Sites, Movement Corridors and Conservation Sites, beginning the year after solar facilities have been installed, and will continue until the Solar Sites have been decommissioned. The results of Tier 1 Studies will be included in the annual report. Upon decommissioning, Tier 1 Studies will be replaced with long-term management/monitoring activities as described in the LTHMP.

Objective:

1. Evaluate the Solar Sites, Conservation Areas, and Movement Corridors to assess the use of these areas by Covered Species and track the expansion of Covered Species.

Task:

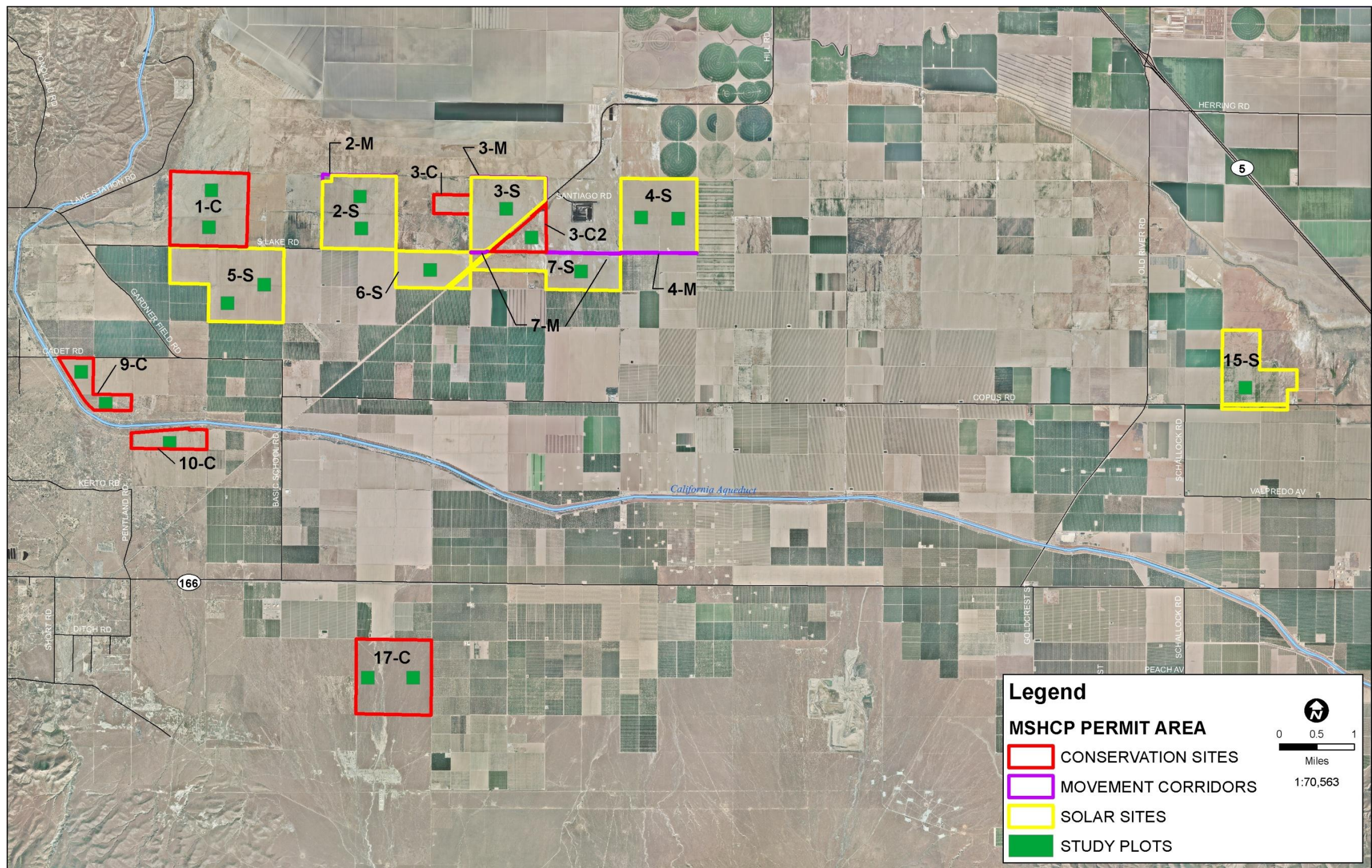
1. Pedestrian survey transects will be conducted throughout the Project to observe use or signs of use by Covered Species and to assess habitat conditions that affect Covered Species. Surveys will be conducted at a rate of one transect every 100 feet on the Project (equivalent

to 53, one mile-long transects per square mile). The configurations of the Movement Corridors are such that only a single transect will be walked along the length of each of the Movement Corridors. Transect surveys will be conducted only when air temperatures are between 77 and 95 degrees Fahrenheit. During these transect surveys, all sightings and diagnostic signs of Covered Species will be noted and other habitat characteristics of note will be qualitatively documented. Transect surveys will be conducted once per survey season, between April 15 and June 30.

2. Night spotlighting for San Joaquin kit fox will be conducted around the perimeter of Project, or if access is not available, around all accessible areas of each site so that the Project receives the maximum amount of visual coverage practicable. Spotlighting will be conducted during three consecutive nights, once each survey season (April 15 to June 30) on each Site of the Project. If San Joaquin kit fox are detected on a Site, further spotlight survey of that Site will be discontinued for that year.
3. All installed dens and perches will be evaluated to determine use by Covered Species. Evaluations will be conducted twice per year, once between April 15 and June 30, and once between August 1 and October 1. All sightings and diagnostic signs of Covered Species will be documented.
4. Species verification trapping for TKR will be conducted in areas where small mammal burrows were observed during pedestrian transect surveys. Trapping will be conducted once each survey season (April 15 to June 30) until a TKR is captured, or for a maximum of three consecutive nights. No more than two representative areas per 320 acres will be trapped. The number of traps deployed will be dependent upon the number and distribution of burrows present and the patch size of the area occupied. Trapping arrays will be deployed according to the best professional judgment of the Monitoring Biologist. As occupied patch sizes increase, additional traps may be needed, up to a maximum of 100 deployed traps per Site. During any given year, no Tier 1 level trapping will be required on portions of the Project where Tipton kangaroo rats have been trapped within Tier 2 Study Plots.

3.1.7.2 Tier 2 Studies

Tier 2 Studies will be conducted for the first five years following the construction of the Solar Sites, and following the recordation of a conservation easement on the Conservation Sites, and then once every three years until the Solar Sites have been decommissioned. Tier 2 Studies will consist of the establishment of permanent Study Plots, where measurements and observations can be repeatedly taken. A minimum of one Study Plot will be established on each Conservation or Solar Site, and at a maximum rate of one Study Plot per 320 acres. At full Project build-out there will be 18 study plots, totaling 360 acres, established within the Project (Figure 3). The results of Tier 2 Studies will be included in the annual report. Upon decommissioning, Tier 2 Studies will be replaced with long-term management activities as described in the LTHMP.



STUDY PLOT SITE PLAN MARICOPA SUN SOLAR COMPLEX, KERN COUNTY, CALIFORNIA

Figure
3

Each Study Plot will be a 20-acre square, roughly centered within each Conservation or Solar Site (or 320-acre portion thereof), or adjusted based on site conditions according to the best professional judgment of the Monitoring Biologist. Within each Study Plot, plant transects, small mammal trapping lines, bird survey transects and point counts, and reptile transects will be established. In addition to these plot-specific activities, off-plot activities conducted as part of Tier 2 Studies will include plant transects and track station monitoring. All transects within each Study Plot will be placed at right angles to the solar installations to ensure that each transect encompasses the greatest amount of diversity available on the plot (i.e., both vegetated areas that are anticipated to develop under the solar panels and the non-vegetated maintenance roads situated between the panels). A conceptual Study Plot design is provided (Figure 4). Sampling will be conducted concurrently (within a three-week period) and during the same period annually to minimize temporal variation.

Descriptive statistics (e.g., Student's t-tests, Analysis of Variance) and other relevant statistical analyses will be performed as appropriate using suitable statistical software. Repeated measures analysis will be used to assess temporal changes in vegetation and wildlife use over time and in response to habitat changes. Specific methodologies used for each sampling regime are described below.

Objective:

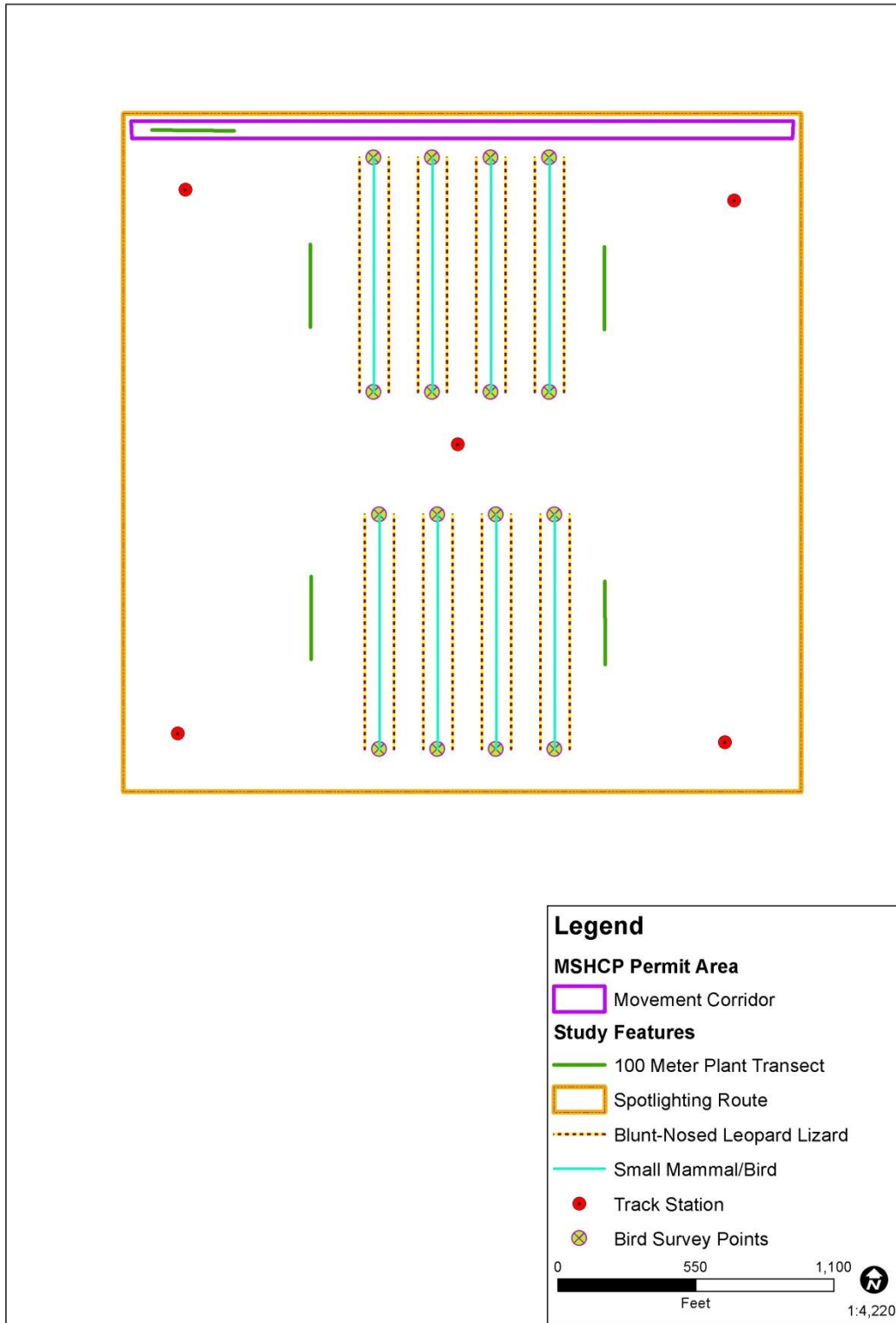
1. Evaluate the Solar Sites, Conservation Areas, and Movement Corridors to assess the use of these areas by Covered Species and track the expansion of Covered Species.

Task:

1. VEGETATION SAMPLING

Vegetation sampling will be conducted along four, 100-meter long transects. Sampling will occur during the spring of each sampling year. Within the Solar Sites, a stratified random sampling approach will be employed, with each transect divided into two primary categories; areas under solar panels and areas not under solar panels. A simple random sampling approach will be employed on Study Plots established on the Conservation Sites. The following measurements will be taken:

- Annual measurements from ten rectangular vegetation quadrants (35 cm x 70 cm) will be taken from each transect (five under panels and five not under panels on the Solar Sites). All species in each quadrant will be noted, and the percent cover of each species will be estimated using a modified Daubenmire cover scale (Bonham 1989). Total percent cover of all vegetation within the quadrant will be estimated using the same cover scale. When identification to species level is not possible, species will be assigned morpho-species names (e.g., "unknown Atriplex," "unknown with red cotyledons");



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CONCEPTUAL STUDY PLOT CONFIGURATION FOR LONG-TERM MONITORING STUDIES ON THE COVERED LANDS

Figure
4

- The height and species of annual vegetation and shrubs will be measured annually at points along 1-meter intervals along each transect. The percent shrub cover will be calculated by recording the length of the intersection of shrub canopy along the transect and then dividing that by the length of the transect;
- Representative digital photographs will be taken annually at each end of each plant transect to provide a record of vegetation conditions occurring on each site;
- Two additional 100-meter transects will be established along each of the Movement Corridors and will follow the above protocols; and
- Monthly measurements, taken from January to June, of species composition and cover from two quadrants from each transect will be taken to track species successional patterns following the cessation of disking to better inform future management actions. Information collected will follow the above protocols. Monthly and annual measurements will overlap, and in that instance, the data will only be recorded once and applied to both measurement tasks.

2. SMALL MAMMAL TRAPPING

Small mammal trapping will be conducted along four trapping lines established on each Study Plot. Trapping will occur in April and October of each sampling year. Each trapping line will be approximately 1,000 feet long, containing 20 traps spaced at 50-foot intervals, resulting in a total of 80 ShermanTM live-traps on each plot. Traps will be checked for four consecutive nights each trapping period. Trapping will be conducted as follows:

- Traps will be opened before sunset and baited with a mixture of proso millet, cracked oats, and peanut butter;
- All traps will be checked at approximately 0200 hours and then closed for the night;
- All animals captured will be identified to species. The sex, sexual condition, and weight of each animal will be recorded; and
- Each animal captured will be marked by clipping a patch of fur on its hindquarters to distinguish newly captured animals from recaptures.

3. BIRD SURVEYS

Four bird survey transects will be established on each Study Plot (various transects may overlap) and will be walked for four consecutive survey days in January, April, July, and October of sampling years. Bird observations will be conducted as follows:

- Transects will be surveyed during the first 3.5 hours after sunrise, on days when there is no rain, and the wind speed is below 10 mph;

- Each transect survey will be uniformly time-constrained to standardize the level of search effort expended;
- A biologist familiar with the songs, calls, and visual characteristics of the birds of the region will identify to species every bird seen or heard within 150 feet of each transect line; and
- During the transect surveys, point-counts will be conducted at each end of each transect, with five minutes being spent at each point. All birds seen or heard will be tallied for each point sampled.

4. REPTILE AND NELSON’S ANTELOPE SQUIRREL SURVEYS

Eight transects per Study Plot, each approximately 1,000 feet long will be established. The transects will be spaced at intervals of approximately 100 feet, and walked for twelve survey days between April 15 and July 15. Herpetofaunal/NAS surveys will be conducted as follows:

- Sampling will be conducted on no more than two periods of four consecutive days each on any given plot;
- Transects will be walked in the morning hours when temperatures are between 77 and 95 degrees F and wind speeds are less than 10 mph;
- Each transect survey will be uniformly time-constrained to standardize the level of search effort expended and will follow standard grid survey protocols (Tollestrup, 1979);
- Qualified Personnel familiar with the herpetofauna of the region and NAS will search the area within 50 feet of each transect for the presence of lizards, other reptiles and NAS; and
- All individuals detected will be identified to species and a GPS location of each animal observed will be recorded.

5. TRACK AND CAMERA STATIONS

Track and camera stations (Station) will be established throughout the Project. Stations will consist of a 3-foot diameter area covered with fire clay or dolomite, and a digital camera that is activated by an infrared/motion sensitive trigger. Stations will be operated as follows:

- Upon full build-out, 42 Stations will have been established. Additionally, each artificial den will have a “camera-only” Station to determine use of the den by SJKF;
- Each Station will be checked daily for four consecutive days during January, April, July, and October of each monitoring year;
- Each Station will be baited with a tin of cat food that will be replaced as needed; and

- Stations will be inspected daily for tracks and have all digital images will be downloaded. All photographs will be archived and reviewed to produce an inventory of species visiting the Stations.

3.1.8 REVEGETATION

The disked Movement Corridors and Conservation Sites may require both passive and active restoration. It is anticipated that the disked Sites will naturally re-vegetate following cessation of disking with a variety of native species, including alkali seepweed (*Suaeda* sp.), saltbush (*Atriplex* sp.), cheeseweed, and various native and non-native annuals (Germano et al. 2012). Seeding may be required to help establish native vegetation within some portions of the Sites. If individual Sites have not been sufficiently recolonized after three growing seasons, native seeds will be planted. The surrounding natural vegetative communities have a relatively low density of native grasses, forbs and shrubs, and the Covered Species are generally associated with low density vegetative communities therefore, the goal is at least a 15 percent cover of native grasses, forbs and shrubs.

In the event that any formerly disked individual Movement Corridor or Conservation Site does not achieve 15 percent native cover following the third year of Tier 2 vegetation monitoring (Section 3.1.7.2), the following seeding measures will be implemented:

- The seed palette for restoration efforts will include a minimum of five species selected from Table 4, with at least one being a shrub species. Other species may be substituted with the recommendation of Qualified Personnel and the approval of the USFWS;
- The native seed will be applied to the Movement Corridors and Conservation Sites via hand-broadcast seeding or the use of a seed drill;
- To hand broadcast:
 - Seed may be mixed with equal parts clean and damp sand to aid in broadcasting;
 - Seed mix is applied in a two-step application, as follows:
 - Step one consists of broadcasting one-half of the seed mix across the planting area in one direction (e.g., north to south); and
 - Step two consists of broadcasting the remaining seed over the same area while moving in a perpendicular direction to step one.
 - Hand broadcast seeding will occur only during low to no wind conditions; and
 - Subsequent to broadcasting, seeds will be worked into the soil with rakes.
- A seed drill may also be used if it is determined by the Qualified Personnel to be the most effective way to apply seeds;

- Supplemental water application, if any, will be applied as determined necessary by the Qualified Personnel, subject to review and approval by the USFWS, and will be based upon weather patterns and soil moisture levels;
- Seeding grasses and forbs in the Central Valley is likely to be most successful in the winter when soils are moist and seeds are poised to undergo spring germination; and
- Seeding rates will be determined based upon the species used and the recommended seeding rates from seed suppliers, generally in the range of 5 to 15 pounds per acre.

Table 5
Seed Palette, Maricopa Sun Solar Complex Project, Kern County, California

Forb and Grass Species	Shrub Species
<i>Common spikeweed (Hemizonia pungens)</i>	<i>Seepweed (Suaeda moquinii)</i>
<i>Alkali goldfields (Lasthenia chrysantha)</i>	<i>Valley saltbush (Atriplex polycarpa)</i>
<i>Alkali barley (Hordeum depressum)</i>	<i>Spiny saltbush (Atriplex spinifera)</i>
<i>Peppergrass (Lepidium sp.)</i>	<i>Cheeseweed (Isocoma acedenia)</i>
<i>Small fescue (Vulpia microstachys)</i>	<i>Iodine bush (Allenrolfea occidentalis)</i>

3.1.9 DECOMMISSIONING

Decommissioning of the Solar Sites will occur within the 35 year permit term and will involve the removal of solar panels, removal of other power generation infrastructure, and replacement of security fencing with barbed wire fencing as described for the Conservation Sites, etc. Following decommissioning, the Solar Sites and Movement Corridors will be converted to Conservation Sites, at which time they will be managed for Covered Species via the LTHMP.

Objective:

1. Transition habitat monitoring activities on Project from IHMP to LTHMP.

Task:

1. Following decommissioning, all habitat management activities associated with this IHMP will be discontinued and the LTHMP will be in-force on the Project, and funded by the endowment.

3.1.10 ADAPTIVE MANAGEMENT

Adaptive management is defined as the use of new information gathered from a monitoring program or from other sources to adjust management strategies and practices to improve conservation of a Covered Species (California Fish and Game Code 2805(a)). Adaptive management is important in land management because it allows flexibility in managing a project to achieve the plan goals and objectives. The management tasks identified in this IHMP are based on the current understanding of the Project. As the Project is monitored over time, new

data will become available that may trigger changes to the management tasks to improve habitat quality.

The six main steps in adaptive management are:

1. Identification of the problem or management goal;
2. Design of the management action or implementation task(s);
3. Implementation;
4. Monitoring of the results;
5. Evaluation of the results relative to the desired management goals; and
6. Adjustment of management actions.

Objective:

1. Maintain flexibility to modify management strategies and methods to ensure that the protected habitats are maintained in good condition such that they will continue to be suitable to support the Covered Species and habitats in perpetuity.

Task:

1. The Project Administrator shall consider new technologies and practices to achieve the goal: to preserve the species and habitats for which the MSHCP has been prepared. Adaptation of the methods described in this IHMP must be agreed upon by the Project Administrator and the USFWS. Techniques to address management of new conditions, if not addressed in this IHMP, may be implemented by the Project Administrator upon review and written approval by the USFWS.

3.2 Species-specific Objectives and Tasks

Species-specific objectives and tasks are actions and activities that are intended to specifically enhance habitat conditions for the Covered Species. Some species may have overlapping objectives and tasks.

3.2.1 SAN JOAQUIN KIT FOX

Objective:

1. Provide Movement Corridors that abut four Solar Sites to facilitate the movement of SJKF within and among the Solar Sites.

Task:

1. Four 50-foot- wide Movement Corridors, totaling 33.8 acres, abutting Solar Sites 2-S, 3-S, 4-S and 7-S will be designated (Figure 2). The Movement Corridors will be established concurrent with the development of the abutting Solar Sites and upon establishment they will no longer be disked.

2. The Movement Corridors will be enhanced by the installation of 44 artificial dens for SJKF, to serve as escape cover and natal dens. Dens will be created at a rate of 10 per linear mile, with 4 being constructed as natal dens and the remaining 40 being constructed as escape dens. Artificial dens will be constructed according to the designs in Appendix D of the MSHCP.

Objective:

2. Provide Conservation Sites to act as dispersal habitat and enhance the Conservation Sites to facilitate SJKF use.

Task:

1. Conservation Sites 1-C, 3-C, 3-C2, 9-C, 10-C, and 17-C will be established and permanently protected with a conservation easement recorded in the favor of the Conservation Easement Holder. Conservation Sites will be established as described in the phasing plan (Chapter 8, MSHCP 2014). The Project will progress by six phases (Table 8-2, MSHCP 2014), each incorporating additional solar development lands (onsite lands or Solar Sites) and conservation lands (offsite lands or Conservation Sites). Conservation Sites will be recorded with conservation easements at a final ratio of 0.5:1 of off-site Conservation Sites to Solar Sites. Each of the six phases will provide conservation lands at different ratios (ranging from 0.6:1 up to 0.9:1, with all conservation lands being encumbered prior to Phase 6)). An endowment will be established that will fund the perpetual management of the Conservation Sites. The endowment will be funded in proportion to the acreage that has been established as a Conservation Site.
2. Upon recordation of the Conservation Easement, any disking will be discontinued and permanently prohibited so that vegetation can recolonize the Conservation Site.
3. The Conservation Sites will be enhanced by the installation of 96 artificial dens for SJKF. Dens will be created at a rate of one den per 20 acres, with 9 being constructed as natal dens and the remaining 87 being constructed as escape dens. Artificial dens will be constructed according to the designs in Appendix D of the MSHCP.
4. Following the decommissioning of the Solar Sites, the Solar Sites and Movement Corridors will also be managed as Conservation Sites and be managed for Covered Species.

3.2.2 TIPTON KANGAROO RAT

Objective:

1. Preserve existing populations of the TKR within the Permit Area.

Task:

1. TKR are known from Conservation Sites 1-C and 9-C. These lands will be permanently protected with a Permanent Conservation Easement (see Section 3.2.1, Objective 2, Task 1, above).

Objective:

2. Provide habitat for TKR within the Permit Area.

Task:

1. Disking of Conservation Sites will be discontinued and permanently prohibited (see Section 3.2.1, Objective 2, Task 2, above).
2. Portions of Conservation Site 1-C and all of Conservation Sites 3-C, 3-C2 are within flood prone areas within the range of TKR. Topographic relief will be installed in the flood prone areas of the Conservation Sites to provide refugia for TKR in the event of flood flows. Topographic relief will be created using tractors or other heavy machinery at Conservation Sites 1-C and 3-C at a rate of 10 percent cover (total of 26.76 acres combined for Conservation Sites 1-C and 3-C), consisting of shallow depressions (approximately one foot below grade) and raised areas (approximately 6 inches above grade). Conservation Site 3-C2 has not been disked in approximately 6 years and has had substantial recolonization by plant and animal species. Topographic relief will be created on Conservation Site 3-C2 only in areas that avoid small mammal burrows and that would remove patches of weedy vegetation. Prior to the installation of topographic relief on Conservation Site 3-C2, the Site will be inspected by the Monitoring Biologist and the Project Administrator for conditions that are suitable for topographic relief installation. Topographic relief will not be installed if, in the judgment of the Monitoring Biologist, Conservation Site 3-C2 has had sufficient recolonization such that installation of topographic relief would either not be feasible or would cause more harm than benefit.
3. Solar Sites will become Conservation Sites upon decommissioning (see Section 3.2.1, Objective 2, Task 1, above).

3.2.3 NELSON'S ANTELOPE SQUIRREL**Objective:**

1. Preserve existing populations of NAS within the Permit Area.

Task:

1. NAS are known from Conservation Site 9-C, and may be present on Conservation Site 17-C, which contains saltbush scrub habitat. These lands will be permanently protected with a conservation easement as described above in Section 3.2.1, Objective 2, Task 1.

Objective:

2. Provide habitat for NAS within the Permit Area.

Task:

1. Disking of Conservation Sites will be discontinued and permanently prohibited (see Section 3.2.1, Objective 2, Task 2, above).
2. Topographic relief will be installed for TKR (see Section 3.2.2, Objective 2, Task 2, above), which is anticipated to also benefit NAS.
3. Solar Sites will become Conservation Sites upon decommissioning (see Section 3.2.1, Objective 2, Task 1, above).

3.2.4 WESTERN BURROWING OWL

Objective:

1. Preserve existing populations of the WEBO within the Permit Area.

Task:

1. WEBO are known from both Conservation Sites and Solar Sites. The owls occurring on the Solar Sites are transient foragers, are not associated with burrows or dens, and do not breed on the Solar Sites. All of the Conservation Sites either currently support breeding western burrowing owls, or will have the habitat features necessary to support breeding WEBO following the cessation of disking. The Conservation Sites will be permanently protected with a conservation easement as described above in Section 3.2.1, Objective 2, Task 1.

Objective:

2. Provide habitat for WEBO within the Permit Area.

Task:

1. Disking of Conservation Sites will be discontinued and permanently prohibited (see Section 3.2.1, Objective 2, Task 2, above).

2. Topographic relief will be installed for TKR (see Section 3.2.2, Objective 2, Task 2, above), which is also anticipated to benefit WEBO.
3. Perching posts constructed from T-posts will be installed on both the Conservation Sites and the Movement Corridors. Perching posts will consist of a cut, 2-foot long section of post welded to the top of each T-post at a right angle to the main post. Perching posts will be installed on the Conservation Sites at a rate of one per 20 acres (96 posts). Perching posts will be installed on the tops of berms in the Movement Corridors at a rate of 8 perching posts per mile (36 posts) and will co-occur with 25 percent of the artificial dens (Section 3.2.1, Objective 2, Task 3, above).
4. Solar Sites will become Conservation Sites upon decommissioning (see Section 3.2.1, Objective 2, Task 1, above).

3.2.5 BLUNT-NOSED LEOPARD LIZARD

Objective:

1. Preserve existing populations of the BNLL within the Permit Area.

Task:

1. BNLL are assumed present on the portions of Conservation Site 9-C that contains saltbush scrub habitat. These lands will be permanently protected with a conservation easement as described above in Section 3.2.1, Objective 2, Task 1.

Objective:

2. Provide habitat enhancements for BNLL within the Permit Area.

Task:

1. Disking of Conservation Sites will be discontinued and permanently prohibited (see Section 3.2.1, Objective 2, Task 2, above).
2. Topographic relief will be installed for TKR (see Section 3.2.2, Objective 2, Task 2, above), which is also anticipated to benefit BNLL.
3. Solar Sites will become Conservation Sites upon decommissioning (see Section 3.2.1, Objective 2, Task 1, above).

4.0 REPORTING AND ADMINISTRATION

4.1 Reporting

The Project Administrator, in conjunction with the Qualified Personnel, will be responsible for preparing and submitting (through Project Administrator) an annual report to the USFWS, with a copy to the Conservation Easement Holder, within 30 days following the end of each calendar year. Reporting will be done according to the conditions of the MSHCP (Chapter 5, MSHCP 2014).

During the life of the Project, the IHMP and the LTHMP will have overlapping reporting requirements. It is anticipated that the reporting requirements for both plans will be combined into a single report for efficiency in preparation and Agency review.

4.2 Administration

4.2.1 NOTIFICATION

The Project Administrator shall be responsible for providing notification to the USFWS for any activities requiring Agency review and approval as described in the MSHCP (Chapter 2, MSHCP 2014).

4.2.2 EMERGENCIES

The Project Administrator is responsible for identifying emergency situations that require immediate action, as described in the MSHCP (Chapter 2, MSHCP 2014).

5.0 TRANSFER, REPLACEMENT, ADMENDMENTS, NOTICES

5.1 Transfer

The Project Administrator shall notify and receive approval from the USFWS of any subsequent transfer of responsibilities under this IHMP to a different Project Administrator. Any subsequent Project Administrator will then assume all Project Administrator responsibilities described in this IHMP, unless otherwise amended in writing and approved by the USFWS.

5.2 Replacement

If the Project Administrator fails to implement the tasks described in this IHMP and is notified of such failure in writing by the USFWS, the Project Administrator shall have 90 days to cure such failure. If failure is not cured within 90 days, the Project Administrator may request a meeting with the USFWS to resolve the failure. Such meeting shall occur within 30 days, or a longer period if approved by the USFWS.

5.3 Amendments

The Project Administrator and the USFWS may occasionally meet at the request of any one of them, to revise the IHMP to refine the areas covered by the IHMP, or to better meet management objectives and preserve the habitat and conservation values of the Permit Area. Any proposed changes to the IHMP shall be discussed by the USFWS and the Project Administrator. Any proposed changes will be designed with input from all parties. Amendments to the IHMP shall be approved by the USFWS in writing, shall be required management components, and shall be implemented by the Project Administrator.

If the USFWS determines in writing that continued implementation of this IHMP would jeopardize the continued existence of a federally-listed species, any written amendment to this IHMP that is determined by the USFWS as necessary to avoid jeopardy, shall be a required management component and shall be implemented by the Project Administrator.

5.4 Notices

Any notices regarding this IHMP should be directed as follows:

Project Administrator:

Maricopa Sun, LLC
Contact: Jeffery Roberts
1396 W. Herndon Avenue, Suite 101
Fresno, CA 93711
(559) 439-0900

Approving Resource Agency:

United States Fish and Wildlife Service
Contact: Justin Sloan, San Joaquin Valley Branch
2800 Cottage Way, Suite W-2608
Sacramento, CA 95825
(916) 414-6600

6.0 REFERENCES

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